

REMARKS

The above amendments and these remarks are responsive to the Office Action issued on August 12, 2004. A petition for a three-month extension of time is submitted concurrently hereto.

By this response, claims 1-3, 5-10, 12-19 and 21-23 are amended, and claim 20 is cancelled without prejudice. No new matter is added. Claims 26-41 were previously withdrawn. Claims 1-19 and 21-25 are now active for examination.

The Office Action dated August 12, 2004 rejected claim 10 under 35 U.S.C. §102(b) as being anticipated by Nozawa (U.S. Patent No. 5,736,934). Claims 1-3, 7 and 22 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Soliman (U.S. Patent No. 6,429,815) in view of Manabe (U.S. Patent No. 5,423,067). Claims 4, 5 and 8 were rejected as being unpatentable over Soliman and Manabe, and further in view of Pirila (U.S. Patent No. 6,674,860). Claim 6 was rejected under 35 U.S.C. §103(a) as being unpatentable over Soliman and Manabe, and further in view of Nozawa. Claim 11 was rejected under 35 U.S.C. §103(a) as being unpatentable over Nozawa in view of Ushiki (U.S. Patent No. 6,549,775). Claims 12 and 13 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Nozawa and Ushiki, and further in view of Pirila. The Examiner rejected claim 14 under 35 U.S.C. §103(a) as being unpatentable over Nozawa in view of Pirila, and claim 15 under 35 U.S.C. §103(a) as being obvious over Nozawa in view of Soliman. Claim 16 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Nozawa and Soliman, and further in view of Ushiki. Claim 17 was rejected under 35 U.S.C. §103(a) as being unpatentable over Nozawa and Soliman, and further in view of Pirila. The Office Action rejected claim 18 under 35 U.S.C. §103(a) as being obvious over Nozawa, Soliman, Ushiki, and further in view of Pirila. Claims 19 and 21 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Ushiki in view of Manabe. The Examiner

rejected claims 20 and 23 under 35 U.S.C. §103(a) as being unpatentable over Pirila in view of Manabe. Claims 24 and 25 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Soliman and Manabe, and further in view of Watters (U.S. Patent No. 6,230,018). The Examiner indicated that claim 9 would be allowable if it is rewritten into independent form including every limitation of the base claim and any intervening claims.

It is respectfully submitted that the rejections are overcome in view of the claim amendments and remarks presented herein.

The Rejection of Claim 20 Is Moot

By this response, claim 20 is cancelled without prejudice. Therefore, the rejection of claim 20 is now moot.

The Rejections of Claims 1-8, 22, 24 and 25 Are Overcome

Claims 1-3, 7 and 22 were rejected under 35 U.S.C. §103(a) as being unpatentable over Soliman in view of Manabe. The rejection is respectfully traversed because Soliman and Manabe cannot support prima facie case of obviousness.

By this Response, claim 1 is amended to improve wording and to correct grammatical errors. No new matter is added. Claim 1, as amended, is reproduced below:

A method of furnishing a location service comprising:
transmitting a specific signal pattern at given intervals from at least three base stations, wherein a location of a mobile terminal or station that receives said signal pattern is located by using positional information about said base stations, sending timing or information on a phase shift from reference time of each said signal pattern from said base stations, and signal pattern receiving time information;
making a change to the sending timing of said signal pattern from at least one of said base stations; and
responsive to the change of the sending timing of the signal pattern, notifying said mobile terminal or station of an altered reference time offset or information on a phase shift from the reference time of said sending timing or updated sending timing of said signal pattern.

Therefore, a method according to claim 1 determines a location of a mobile terminal or station based on information related to (1) timing of signals sent from the base stations, (2) positions of the base stations, and (3) timing of the signals received at the mobile terminal or station. The method further includes a step of deliberately changing the sending timing of the signal pattern from the base stations. The mobile terminal is notified of such deliberate change in the sending timing of the signal pattern. Appropriate support for the amendment can be found in, for example, page 15, first paragraph of the written description.

In contrast, the system described in Soliman does not deliberately alter or change the timing of sending pilot signals or sequences. Fig. 10 of Soliman, which is relied on by the Office Action to support the rejection, illustrates the effect on the relative timing of the pilot PN sequences, caused by the internal BS delay. According to Soliman, the “internal BS delay” is defined as a hardware delay through the transmission chain, which is caused by a propagation delay associated with transmitting each pilot PN sequence to the center of radiation of the antenna 43 within the communication antennas 201 of a base station 10. See col. 20, lns. 43-55 of Soliman. Therefore, the internal BS delay is incidental to the transmission operations. The base stations in Soliman does not **deliberately** make a change to the timing for transmitting signal patterns, as described in claim 1. Furthermore, Soliman does not disclose determining a location of a mobile terminal or station based on information related to (1) timing of signals sent from the base stations (which is deliberately changed), (2) positions of the base stations, and (3) timing of the signals received at the mobile terminal or station, as described in claim 1.

The other reference, Manabe, also fails to teach or suggest making a deliberate change to the timing of sending the signal patterns, as described in claim 1. Neither does Manabe teach or describe determining a location of a mobile terminal or station based on information related to

Application No.: 09/781,187

(1) timing of signals sent from the base stations (which is deliberately changed), (2) positions of the base stations, and (3) timing of the signals received at the mobile terminal or station, as described in claim 1. Therefore, Soliman and Manabe, even combined, do not teach every limitation of claim 1. Accordingly, Soliman and Manabe cannot support a prima facie case of obviousness. The obviousness rejection of claim 1 based on Soliman and Manabe is untenable and should be withdrawn. Favorable reconsideration of claim 1 is respectfully requested.

Claims 2, 3 and 7, directly or indirectly, depend on claim 1, and incorporate every limitation thereof. Accordingly, claims 2, 3 and 7 also are patentable over Soliman and Manabe for at least the same reasons as for claim 1, as well as based on their own merits. Favorable reconsideration of claims 2, 3 and 7 is respectfully requested.

Similar to claim 1, independent claim 22 also describes a base station that deliberately changes the timing for sending signal patterns. A mobile terminal that receives the signal patterns determines its own location based on information related to (1) the altered sending timing of the signal patterns from the base stations caused by the deliberate change, (2) positions of the base stations, and (3) timing of the signals received at the mobile terminal or station.

As discussed above relative to claim 1, neither Soliman nor Manabe teaches a deliberate change of the timing for sending signal patterns. Furthermore, Soliman and Manabe both fail to describe a mobile terminal determines its own location based on information related to (1) the altered sending timing of the signal patterns from the base stations caused by the deliberate change, (2) positions of the base stations, and (3) timing of the signals received at the mobile terminal or station, as described in claim 22. Therefore, claim 22 is patentable over Soliman and Manabe. Favorable reconsideration of claim 22 is respectfully requested.

Claims 24 and 25 were rejected as being unpatentable over Soliman and Manabe, and further in view of Waters. Claims 24 and 25 are dependent from claim 22 and incorporate every limitation thereof. As discussed relative to claim 22, Soliman and Manabe, combined, do not disclose a deliberate change on the timing to send signal patterns from a base station, as required by claims 24 and 25 by virtue of their dependencies from claim 22. Furthermore, Soliman and Manabe both fail to describe a mobile terminal that determines its own location based on information related to (1) the altered sending timing of the signal patterns from the base stations caused by the deliberate change, (2) positions of the base stations, and (3) timing of the signals received at the mobile terminal or station, as described in claims 24 and 25 through their dependencies from claim 22.

Waters was relied on by the Office Action for describing a server for storing information related to sending timing, and does not teach or suggest a deliberate change on the timing to send signal patterns from a base station, as required by claims 24 and 25. Neither does Waters describe a mobile terminal that determines its own location based on information related to (1) the altered sending timing of the signal patterns from the base stations caused by the deliberate change, (2) positions of the base stations, and (3) timing of the signals received at the mobile terminal or station, as described in claims 24 and 25. Accordingly, Soliman, Manabe and Waters, even combined, do not disclose every feature described in claims 24 and 25. Therefore, Soliman, Manabe and Waters cannot support a prima facie case of obviousness. The obviousness rejection of claims 24 and 25 is untenable and should be withdrawn. Favorable reconsideration of claims 24 and 25 is respectfully requested.

Claims 4, 5 and 8 were rejected as being unpatentable over Soliman and Manabe, and further in view of Pirila. It is submitted that the rejection of claims 4, 5 and 8 is overcome

because Soliman, Manabe and Pirila, even if combined, do not disclose every limitation of the claims.

Claims 4, 5 and 8, directly or indirectly, depend on claim 1 and incorporate every limitation thereof. Therefore, claims 4, 5 and 8 are patentable over Soliman and Manabe for at least the same reasons as for claim 1.

Pirila does not alleviate the deficiencies of Soliman and Manabe. Pirila was relied on by the Office Action for describing updates of charge data related to a mobile terminal. However, Pirila does not teach or suggest a deliberate change on the timing to send signal patterns from a base station, as required by claims 4, 5 and 8. Neither does Pirila describe determining a location of a mobile terminal based on information related to (1) the altered sending timing of the signal patterns from the base stations caused by the deliberate change, (2) positions of the base stations, and (3) timing of the signals received at the mobile terminal or station, as described in claims 4, 5 and 8 through their dependencies from claim 1. Accordingly, Soliman, Manabe and Pirila, even combined, do not disclose every feature described in claims 4, 5 and 8. Consequently, Soliman, Manabe and Pirila cannot support a prima facie case of obviousness. The obviousness rejection of claims 4, 5 and 8 is untenable and should be withdrawn. Favorable reconsideration of claims 4, 5 and 8 is respectfully requested.

The Office Action rejected claim 6 as being unpatentable over Soliman and Manabe, and further in view of Nozawa. Claim 6 depends on claim 1 and incorporates every limitation thereof. Therefore, claim 6 is patentable over Soliman and Manabe for at least the same reasons as for claim 1.

The other reference, Nozawa, does not alleviate the deficiencies of Soliman and Manabe. The sections in Nozawa that was relied on by the Office Action merely describes sending a

paging signal multiple times in different signal frames. The location or subframe in which the paging signal locates within a single signal frame is changed each time a new signal frame is generated. Since each signal frame is transmitted as a whole, the timing for sending each signal frame is the same. Therefore, Nozawa does not specifically describe a deliberate change on the timing to send signal patterns from a base station, as described in claim 6. Furthermore, there is no specific teaching or suggestion in the cited references to use the shift of subframes as described in Nozawa in determining a location of a mobile terminal. Accordingly, Soliman, Manabe and Nozawa, even if combined, do not teach every limitation of claim 6. Therefore, the obviousness rejection of claim 6 is untenable and should be withdrawn. Favorable reconsideration of claim 6 is respectfully requested.

The Rejections of Claims 10-14 Are Overcome

Claim 10 was rejected under 35 U.S.C. §102(b) as being anticipated by Nozawa. By this Response, claim 10 is amended. It is submitted that the anticipation rejection of claim 10 is overcome because Nozawa fails to teach every limitation of claim 10.

Claim 10, as amended, describes a method that determines a location of a mobile terminal based on timing of signal patterns transmitted from a plurality of base stations and receiving timing of the signal patterns at the mobile terminal or station. A deliberate change is made to the sending timing of a specific signal pattern of radio waves transmitted at given intervals from a base station regularly. The mobile terminal or station is notified about an altered reference time offset of the sending timing or updated sending timing of the signal pattern.

On the other hand, Nozawa merely describes paging a mobile device by repeatedly transmitting the same paging signal in n paging signal frames. As discussed earlier relative to claim 6, the location or subframe in which the paging signal locates within a single signal frame

is changed each time a new signal frame is generated. Since each signal frame is transmitted as a whole, the timing for sending each signal frame is the same. Furthermore, Nozawa does not discuss determining a location of the mobile terminal based on sending timing of signal patterns transmitted from a plurality of base stations, and receiving timing of the signal patterns at the mobile terminal or station, as described in claim 10. Since Nozawa fails to disclose every limitation of claim 10, Nozawa cannot support a prima facie case of anticipation. The anticipation rejection of claim 10 based on Nozawa is untenable and should be withdrawn. Favorable reconsideration of claim 10 is respectfully requested.

Claim 11 depends on claim 10 and was rejected under 35 U.S.C. §103(a) as being unpatentable over Nozawa in view of Ushiki. As discussed relative to claim 10, Nozawa fails to disclose every limitation of claim 11 by virtue of its dependency from claim 10. Ushiki was cited by the Office Action for describing verification of the identify of the mobile terminal. The sections in Ushiki relied on by the Examiner to reject claim 11 do not specifically teach the approaches as described in claim 11 for determining the location of a mobile terminal. Therefore, Nozawa and Ushiki, even if combined, do not teach every limitation of claim 11. Accordingly, claim 11 is patentable over Nozawa and Ushiki. Favorable reconsideration of claim 11 is respectfully requested.

Claims 12 and 13 were rejected as being unpatentable over Nozawa and Ushiki, and further in view of Pirila. Claims 12 and 13 depend on claim 10 in incorporate every limitation thereof. As pointed out in the discussions related to claims 10 and 11, neither Nozawa nor Ushiki describes the approaches for determining the location of a mobile terminal as described in claims 12 and 13 through their dependencies from claim 10. Pirila merely describes updates of charge data related to a mobile terminal, and does not teach the specific steps described in claims

12 and 13 for determining the location of the mobile terminal. Therefore, Nozawa, Ushiki and Pirila, even combined, do not teach every limitation of claims 12 and 13. The obviousness rejection of claims 12 and 13 based on Nozawa, Ushiki and Pirila is untenable and should be withdrawn. Favorable reconsideration of claims 12 and 13 is respectfully requested.

The Office Action rejected claim 14 as being unpatentable over Nozawa in view of Pirila. As discussed earlier relative to claims 10 and 14, neither Nozawa nor Pirila discloses the specific approaches for determining the location of a mobile terminal, as described in claim 14 by virtue of its dependency from claim 10. Therefore, claim 14 is patentable over Nozawa and Pirila. Favorable reconsideration of claim 14 is respectfully requested.

The Rejections of Claims 15-18 Are Overcome

Claim 15 was rejected as being obvious over Nozawa in view of Soliman. The obviousness rejection is respectfully traversed because Nozawa and Soliman cannot support a prima facie case of obviousness.

Claim 15, as amended, describes a location determination method that deliberately makes a change to the sending timing of a specific signal pattern of radio waves transmitted at given intervals from a base station regularly or at irregular intervals. The location of a mobile terminal or station is calculated based on the receiving timing of said signal pattern received at said mobile terminal or station. The mobile terminal or station is notified of a result of the calculated location.

On the other hand, contrary to the assertion of the Office Action, Nozawa merely describes paging a mobile device by repeatedly transmitting the same paging signal in n paging signal frames, and does not teach or describe a method for furnishing a location service, as required by claim 15. Furthermore, as discussed earlier relative to claim 6, the system in

Application No.: 09/781,187

Nozawa sends each signal frame as a whole, and does not change the timing for sending each signal frame.

Similar to Nozawa, Soliman does not describe deliberately changing the sending timing of a specific signal pattern of radio waves transmitted at given intervals from a base station regularly or at irregular intervals, as described in claim 15. Accordingly, the specific combination of Nozawa and Soliman as suggested by the Examiner does not disclose every limitation of claim 15. Furthermore, there is no specific teaching or suggestion in the cited references to use the shift of subframes as described in Nozawa in determining a location of a mobile terminal. Therefore, Nozawa and Soliman cannot support a prima facie case of obviousness. The obviousness rejection of claim 15 is untenable and should be withdrawn. Favorable reconsideration of claim 15 is respectfully requested.

Claim 16 depends on claim 15, and was rejected as being unpatentable over Nozawa and Soliman, and further in view of Ushiki. Therefore, claim 15 is patentable over Nozawa and Soliman for at least the same reasons as for claim 16.

Ushiki, the other reference relied on by the Office Action, was cited by the Office Action for describing verification of the identification of the mobile terminal, and does not alleviate the deficiency of Nozawa and Soliman. Therefore, Nozawa, Soliman and Ushiki, even combined, do not teach every limitation of claim 16. Accordingly, claim 16 is patentable over Nozawa, Soliman and Ushiki. Favorable reconsideration of claim 16 is respectfully requested.

Claim 17 depends on claim 15 and was rejected as being unpatentable over Nozawa and Soliman, and further in view of Pirila. As discussed relative to claim 15, Nozawa and Soliman, combined, do not teach every limitation of claim 15. Therefore, claim 17 is patentable over Nozawa and Soliman by virtue of its dependency from claim 15.

Pirila, the other reference relied on by the Office Action, does not alleviate the deficiencies of Nozawa and Soliman. Pirila was cited by the Office Action for describing charging for the location service. Pirila, however, does not specifically describe a deliberate alteration of the timing of sending a specific signal pattern of radio waves transmitted at given intervals from a base station, and calculating the location of a mobile terminal or station, based on the receiving timing of said signal pattern received at said mobile terminal or station, as described in claim 17 through its dependency from claim 15. Accordingly, claim 17 is patentable over Nozawa, Soliman and Pirila.

Claim 18 depends on claim 15 and was rejected as being obvious over Nozawa, Soliman, Ushiki, and further in view of Pirila. Based on the same reasons as discussed relative to claims 15 and 17, Nozawa, Soliman and Pirila, even combined, do not teach every feature of claim 18. Ushiki also fails to alleviate the deficiencies. Therefore, Nozawa, Soliman, Ushiki, and Pirila, even combined, cannot support a prima facie case of obviousness. The obviousness rejection of claim 18 is untenable and should be withdrawn. Favorable reconsideration of claim 18 is respectfully requested.

The Rejection of Claims 19 and 21 Are Overcome

Claims 19 and 21 were rejected under 35 U.S.C. §103(a) as being unpatentable over Ushiki in view of Manabe. The rejection is respectfully traversed because Ushiki and Manabe cannot support a prima facie case of obviousness.

Claim 19, as amended, describes A method for locating a mobile terminal or station. An ID of the mobile terminal or station, and a request for information on the sending timing of a specific signal pattern transmitted at given intervals from base stations in the vicinity of the mobile terminal or station are transmitted to a base station in a zone in which the mobile terminal

or station locates. A location of the mobile terminal or station is determined based on an answer from said base station in the zone in which the mobile terminal or station locates, and respective receiving timing of the signal pattern from each of said base stations in the vicinity of the mobile terminal or station.

In contrast, Ushiki only describes a method for registering a mobile terminal's location to a base station, i.e., to notify a base station about the appearance of the mobile terminal in the vicinity of the base station. In the descriptions related to Fig. 5, there is no transmission TO the mobile station. Therefore, there is no "answer" from the mobile station to the mobile device at all. Accordingly, Ushiki does not disclose determining a location of the mobile terminal or station based on an answer from said base station in the zone in which the mobile terminal or station locates, and the respective receiving timing of the signal pattern from each of said base stations in the vicinity of the mobile terminal or station, as described in claim 19. Manabe does not alleviate these deficiencies of Ushiki. Furthermore, Ushiki and Manabe both fail to disclose a location service. Therefore, Ushiki and Manabe, even combined, do not teach every limitation of claim 19. Consequently, the obviousness rejection of claim 19 is untenable and should be withdrawn. Favorable reconsideration of claim 19 is respectfully requested.

Claim 21 depends on claim 19 and incorporates every limitation thereof. For at least the same reasons as for claim 19, claim 21 is patentable over Ushiki and Manabe. Favorable reconsideration of claim 21 is respectfully requested.

The Rejection of Claim 23 Is Overcome

Claims 23 was rejected under 35 U.S.C. §103(a) as being unpatentable over Pirila in view of Manabe. The rejection is respectfully traversed because Pirila and Manabe cannot support a prima facie case of obviousness.

Claim 23, after the amendment, describes a location system that comprises at least three base stations and one mobile terminal or station. The base stations transmit a specific signal pattern at given intervals, and at least one of the base stations deliberately changes the sending timing of said signal pattern. Furthermore, the base stations broadcast encrypted information on sending timing of said signal pattern transmitted from the base stations over at least one broadcast channel or control channel. The mobile terminal or station decrypts the encrypted information on sending timing of said signal pattern transmitted from base stations located in the vicinity of the mobile terminal or station by using a decrypting key, and determines a location of the mobile terminal or station based on (1) the decrypted information that includes information related to the deliberately changed sending time, (2) positional information about said base stations, and (3) information related to receiving timing of each said signal pattern from said base stations.

As discussed earlier, Pirila and Manabe both fail to disclose a deliberate change in the timing of sending signal patterns from the base stations. They also fail to teach determining a location of the mobile terminal or station based on (1) the decrypted information that includes information related to the deliberately changed sending time, (2) positional information about said base stations, and (3) information related to receiving timing of each said signal pattern from said base stations, as described in claim 23. Therefore, Pirila and Manabe, even combined, do not teach every limitation of claim 23. Accordingly, claim 23 is patentable over Pirila and Manabe. Favorable reconsideration of claim 23 is respectfully requested.

Claim 9 Is Patentable

Claim 9 indirectly depends on claim 1 and incorporates every limitation thereof. The Examiner indicated that claim 9 would be allowable if it is rewritten into independent form.

As discussed earlier, claim 1 is in condition for allowance. Therefore, claim 9 also in condition of allowance.

Conclusion

For the reasons given above, Applicants believe that this application is conditioned for allowance and Applicants request that the Examiner give the application favorable consideration and permit it to issue as a patent. However, if the Examiner believes that the application can be put in even better condition for allowance, the Examiner is invited to contact Applicants' representatives listed below.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

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